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The effect of pilates and yoga during pregnancy on birth outcomes: traditional review

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ABSTRACT

Regular exercise during pregnancy has been reported to have positive effects on birth outcomes. The World Health Organization (WHO) and the American College of Obstetrics and Gynecology (ACOG) state that pregnant women should perform at least 150 minutes of moderate intensity aerobic exercise per week. Pilates and Yoga exercises are frequently preferred exercises during pregnancy. Pilates is an exercise model based on the integrity of mind and body. Pilates exercises are one of the most preferred exercises for pregnant women to improve their psychological and physical functions. Pilates exercises during pregnancy have been reported to decrease the rate of perineal injury, the rate of episiotomy application, the duration of labor and pain perception in labor, while increasing the rate of vaginal delivery and postpartum satisfaction level. It is also reported to improve neonatal Apgar score. Yoga is one of the most preferred exercises to improve maternal-fetal health and perinatal outcomes during pregnancy. Yoga is a traditional exercise method based on the unity of body, mind and spirit with breathing techniques and asanas. Yoga exercises during pregnancy have been reported to decrease the rate of vaginal delivery, use of induction of labor, analgesia requirement, preterm delivery rate, degree of episiotomy rupture, duration of labor and pain perception, while increasing the level of Apgar score of the newborn, birth weight of the newborn and postpartum comfort level. More evidence-based studies examining the effect of Pilates and yoga exercises on birth outcomes are needed in the literature. The aim of this review is to examine the results of studies conducted to determine the effect of pilates and yoga exercises during pregnancy on birth outcomes.

Keywords: Birth, pregnancy, pilates, yoga

INTRODUCTION

Pregnancy is a period in which many physical and psychological changes are experienced in women's lives.[1] Many symptoms are observed due to physical and psychological changes during pregnancy.[2] The symptoms experienced during pregnancy and lack of information about exercise cause physical inactivity in pregnant women.[3] Regular physical activity and exercise during pregnancy reduce the risk of postpartum depression and increase quality of life.[4,5]

The World Health Organization (WHO) and the American College of Obstetric and Gynecology (ACOG) suggest that sedentary time should be reduced for pregnant women and at least 150 minutes of moderate intensity aerobic physical activity per week is required.[6,7] According to ACOG, exercise during pregnancy reduces back pain, constipation, risk of gestational diabetes, preeclampsia and cesarean delivery rate.[8] Different types of exercises such as yoga, pregnancy gymnastics, Pilates and kegel exercises are performed during pregnancy. Pilates exercise in pregnancy is recommended by ACOG.[8] Pilates is recognized as an important exercise to improve physical, psychological and motor functions.[9] Pelvic floor exercises are a part of modern pilates.[9] It has been reported that regular exercise strengthens the pelvic floor muscles and increases their structural function.[7]

One of the exercises frequently preferred by pregnant women is pregnancy yoga.[10] Yoga contributes to both physical and psychological health, improves muscle strength, memory, sleep quality, and reduces pain and depression.[11] Yoga practiced during pregnancy enables pregnant women to contact their minds, bodies, spirits and fetuses.[12] It has been reported that yoga exercises during pregnancy reduce anxiety, depression, back and pelvic pain, and reduce labor pain during delivery.[13,14]

In the literature, there are experimental studies examining the effect of yoga and pilates exercises during pregnancy on birth outcomes. Although there are separate review studies examining the effect of yoga[3,10,13] and pilates exercises[15-17] on

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birth outcomes during pregnancy, there is no study in which pilates and yoga exercises are examined together. The aim of this review is to examine the results of studies conducted to determine the effect of Pilates and yoga exercises during pregnancy on birth outcomes.

PILATES EXERCISE IN PREGNANCY

Pilates is an exercise model based on mind and body integrity.[15] Pilates was initially called the "science of control" and later expressed as the integration of mind, body and power coordination.[15] Pilates is based on six movement principles. These are; concentration, control, precision, fluidity of movement, breath and activation of the power center.[18] Pilates combines strength training and general stretching through exercises. Pilates method is known to have benefits such as muscle strength gain, flexibility, coordination, proprioceptin, trunk and pelvic stability and postural improvement for healthy and non-healthy adults.[18] Given the holistic benefits of pilates, its application during pregnancy has attracted attention as a potential method to address the various physical and mental challenges women face during this period.

Pregnancy causes many anatomical, physiologic and mental changes in women.[16] Pregnant women experience physical symptoms such as low back pain, pelvic pain and edema due to changes in the musculoskeletal system.[19] Women who cannot adapt to physical changes during pregnancy experience depression and the fetus is negatively affected.[20] Recently, pilates exercise has been reported to be safe for pregnant women, but it has also been suggested that it may stimulate the abdominal and pelvic muscles.[21] Pilates exercises cause contraction of the deep abdominal muscles, so pilates exercises in pregnant women needs to be individualized.[22] Since implementation of exercise programs that do not take into account individual characteristics and pregnancy status may adversely affect the mother or fetus, the opinions of universal organizations regarding exercise programs in pregnancy are important for safe guidelines. In this context, in the committee opinion of ACOG, pilates exercise is actively recommended for pregnant women.[8]

Considering that pilates is a type of resistance training, it has been reported to alleviate musculoskeletal symptoms that occur during pregnancy, such as pelvic floor dysfunction[23] and diastasis rectus abdominis[24] and to help women physically prepare for delivery and reduce their fear of labor.[17] Although clinical guidelines recommend modified pilates as an appropriate form of pregnancy exercise,[25] there is little objective data showing that pilates is safe or improves birth outcomes, but it has been reported to have no side effects in both low- and high-risk pregnant women.[26, 27]

THE EFFECT OF PILATES EXERCISE DURING PREGNANCY ON BIRTH AND NEONATAL OUTCOMES

Pilates exercises during pregnancy are one of the most important exercises to improve the psychological and physical functioning of pregnant women.[26] Exercises performed to strengthen the abdominal muscles and pelvic floor during pregnancy facilitate natural delivery by reducing pain and making the pelvic ligaments flexible during labor.[28] In 2021, in a quasi-experimental study conducted to examine the effect of pilates exercises on pelvic floor injuries during pregnancy, women in the experimental group were given one hour of pilates exercise twice a week for 4 weeks. According to the results of the study, it was reported that women who practiced pilates exercise had lower perineal injury rates.[29] Aktan et al.[15] (2021), in a study conducted to examine the effect of pilates exercises during pregnancy on birth outcomes, women in the intervention group were exercised 2 days a week for 8 weeks and as a result of the study, it was reported that women felt less pain during labor and Apgar scores of newborns were better. In 2021, in a randomized controlled clinical trial to study the effectiveness of a pilates exercise program during pregnancy on birth outcomes, primiparous women between 26 and 28 weeks of gestation in the intervention group performed pilates exercises for 8 weeks. The results of the study showed that pilates exercise during pregnancy significantly reduced the intensity of labor pain, the length of the active phase and the duration of the second stage of labor and increased maternal satisfaction. No difference was found in terms of episiotomy, mode of delivery, and first and fifth Apgar scores of newborns.[30] In another study conducted to investigate the effect of pilates exercises during pregnancy on birth outcomes and neonatal health, it was reported that the rate of episiotomy and vacuum application was low, the rate of normal delivery and Apgar scores at the 1st minute and 5th minute in newborns were high in women who performed pilates exercises during pregnancy.[31] In a meta-analysis (n=719) study conducted by Zaman[32] (2023) to examine the obstetric, maternal and neonatal outcomes of pilates exercise during pregnancy, it was reported that women who performed pilates exercise during pregnancy were more likely to have vaginal delivery and the duration of labor was shorter.

YOGA EXERCISE IN PREGNANCY

In ancient Indian science, yoga was defined as a lifestyle that includes changes in mental attitude and diet as well as the application of certain techniques.[3] Yoga is a traditional exercise method based on the unity of body, mind and spirit together with breathing techniques and asanas.[14] Although there are many types and styles of yoga, typical yoga practices combine stretching and holding asanas with deep, rhythmic breathing and meditation to increase flexibility and strength. Although Kundalini yoga, Iyengar yoga, Vinyasa yoga and Prenatal yoga are widely used, Hatha yoga is the most preferred type of yoga in western culture.[33] Evidence suggests that Prenatal yoga is safe, feasible and acceptable for pregnant women.[34]

Although yoga exercise during pregnancy is generally a safe exercise method, it has been reported to be risky in hot weather.[36] It is recommended that women should not perform yoga exercises in hot weather because of the increased risk of pregnancy-related injuries.[35]

Prenatal yoga has been reported to have positive effects on stress, anxiety, depression, self-efficacy, duration and mode of labor by increasing the level of physical activity.[34] As a result of increased self-efficacy during pregnancy, women tend to remain calmer throughout labor, which allows them to better manage both the physical and emotional challenges of childbirth. This heightened sense of control not only contributes to more effective pain management but also enhances their ability to actively participate in the labor process and make informed decisions, leading to a more positive birth experience.[36]

THE EFFECT OF YOGA EXERCISE DURING PREGNANCY ON BIRTH AND NEONATAL OUTCOMES

Yoga is one of the exercises used to improve maternal-fetal health and perinatal outcomes in pregnancy.[12] Yoga is accepted as a safe and harmless exercise in pregnancy.[34] Prenatal yoga is known to reduce stress, anxiety and depression and has positive effects on birth outcomes.[12] Prenatal yoga increases the strength and flexibility of key muscle groups involved in the labor process such as the back, waist and pelvic floor muscles.[37] In addition, yoga exercise has an effect on the endocrine and nervous systems during pregnancy, which alleviates stress and negative emotions.[37] In a randomized controlled study examining the effect of prenatal yoga exercises on labor pain and birth outcomes, it was reported that women who practiced prenatal yoga had less need for labor induction, analgesia, and the number of low birth weight babies, a higher rate of vaginal delivery and postpartum comfort level, and a shorter duration of labor.[38] In 2021, in another randomized controlled study examining the effect of integrated yoga performed during pregnancy on birth outcomes, it was reported that the rate of preterm birth and preeclampsia was lower in women who practiced yoga, and the Apgar scores and birth weights of newborns were higher.[39]

Prenatal yoga exercises have been used in many studies investigating the effects of prenatal yoga exercises on the birth process and neonatal outcomes. Rong et al.[40] (2021), in a randomized controlled study on Chinese primiparous women to evaluate the effect of prenatal yoga on birth outcomes, the intervention group was given yoga exercise for 12 weeks. As a result of the study, it was reported that the rate of vaginal delivery was higher and the duration of the 1st, 2nd and 3rd stages of labor was shortened. In 2021, in a clinical study conducted in Iran to determine the effect of yoga on labor and neonatal outcomes in nulliparous pregnant women, the intervention group was given Hatha Yoga exercise twice a week between the 26th and 37th weeks. As a result of the study, it was reported that the rate of natural delivery was higher in women who practiced yoga, episiotomy was applied to pregnant women during delivery, but the degree of episiotomy rupture was less (1 and 0), the birth weights of the babies were higher, and the 1st and 5th minute Apgar scores were higher.[41]

There are many studies examining the positive effects of prenatal yoga exercises on birth outcomes. Rong et al.[42] (2020), in a meta-analysis study in which 7 studies (n=808) were examined to determine the effect of prenatal yoga on birth outcomes, it was reported that prenatal yoga decreased the rate of preterm birth and birth weight of the newborn, shortened the delivery time and increased the rate of vaginal birth. In 2022, in another meta-analysis (n=2217) study in which 29 studies were examined to examine the effect of prenatal yoga on birth outcomes, it was reported that yoga performed during pregnancy decreased anxiety and depression, shortened the delivery time and increased the vaginal birth rate.[34]

Studies examining the effects of prenatal yoga exercises on labour duration and labour pain are also included in the literature. Riawati et al.[43] (2021), in a meta-analysis study in which 9 studies were examined to determine the effect of prenatal yoga on labor duration and labor pain, it was reported that yoga shortened labor duration and decreased the pain score at birth. In 2023, in another meta-analysis study in which 5 studies (n=581) were examined to evaluate the effectiveness of prenatal yoga on labor pain, it was reported that prenatal yoga reduced labor pain.[44]

RECOMMENDATIONS FOR PILATES AND YOGA EXERCISES IN PREGNANCY

Yoga and pilates are safe and effective exercise models to support both physical and mental health in pregnancy. However, it is of great importance that these exercises are planned with the right timing, appropriate frequency and individualized.

1. **Start Time:** It is recommended to start pilates and yoga exercises from the 12th week of pregnancy. Since attention should be paid to the adaptation process of the body in the first trimester, intense exercises should be avoided before this period.[8]
2. **Frequency:** Pregnant women are recommended to do pilates and yoga exercises at least 2-3 times a week, with sessions lasting 30-60 minutes. This frequency is ideal to prevent overstraining while increasing muscle strength and flexibility.[8]
3. **Types of Exercise:** Pilates and yoga are among the exercises that can facilitate the birth process during pregnancy, especially as they strengthen the abdominal and pelvic floor muscles. However, the exercises must be given by experienced instructors and adapted to the physical characteristics of each individual.[8]
4. **Who Should it Be Recommended to?:** Pilates and yoga are recommended for women with low-risk pregnancies. In high-risk pregnancies or in women who have experienced complications in previous pregnancies, physician approval should be obtained before starting these exercises.[8]
5. **Considerations:** During pilates and yoga, excessive stretching or forceful movements should be avoided and attention should be paid to any pain or discomfort that may occur in the body. In addition, exercise programmes should be individualised, as each woman's pregnancy status is different.[8]
6. **Universal Recommendations**: Universal organisations such as the ACOG state that pilates and yoga exercises in pregnancy are safe and that regular exercise is beneficial for both mother and baby. These organisations recommend that exercises should be guided by a health professional and planned according to individual characteristics.[8]

CONCLUSION

Pilates and yoga exercises performed during pregnancy have been reported to reduce the rate of perineal injury, episiotomy application rate, induction of labor, analgesia requirement, duration of labor and pain perception in labor, while improving neonatal Apgar score and increasing the level of postpartum comfort. It is recommended by universal organizations that pilates and yoga exercises should be planned according to individual needs and performed under the expert guidance. In addition, starting exercises in the second trimester of pregnancy may provide more favorable effects on birth outcomes. With a multidisciplinary approach, the

co-operation of health professionals will support the safe and effective implementation of exercises.

ETHICAL DECLARATIONS

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

REFERENCES

1. Jiang Q, Wu Z, Zhou L, Dunlop J, Chen P. Effects of yoga intervention during pregnancy: a review for current status. *Am J Perinatol.* 2014:503-514. doi:10.1055/s-0034-1396701
2. Jarvis S, Nelson-Piercy C. Common symptoms and signs during pregnancy. *Obstet Gynaecol Reprod Med.* 2020;30(10):321-325. doi:10.1016/j.ogrm.2020.07.005
3. Balaji P, Varne SR. Physiological effects of yoga asanas and pranayama on metabolic parameters, maternal, and fetal outcome in gestational diabetes. *Natl J Physiol Pharm Pharmacol*. 2017;7(7):724. doi:10.5455/njppp.2017.7.0306713032017
4. Liu N, Gou W-H, Wang J, Chen D-D, Sun W-J, Guo P-P, et al. Effects of exercise on pregnant women's quality of life: A systematic review. *Eur J Obstet Gynecol Reprod Biol*. 2019;242:170-177. doi:10.1016/j.ejogrb.2019.03.009
5. Nakamura A, van der Waerden J, Melchior M, Bolze C, El-Khoury F, Pryor L. Physical activity during pregnancy and postpartum depression: systematic review and meta-analysis. *J Affect Disord.* 2019;246:29-41. doi:10.1016/j.jad.2018.12.009
6. Jarvis S, Nelson-Piercy C. Common symptoms and signs during pregnancy. *Obstet Gynaecol Reprod Med.* 2020;30(10):321-325. doi:10.1016/j.ogrm.2020.07.005
7. Sitzberger C, Hansl J, Felberbaum R, Brössner A, Oberhoffer-Fritz R, Wacker-Gussmann A. Physical activity in high-risk pregnancies. *J Clin Med*. 2022;11(3):703. doi:10.3390/jcm11030703
8. American College of Obstetric and Gynecology (ACOG). Physical activity and exercise during pregnancy and the postpartum period. Available at: https://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2020/04/physical-activity-and-exercise-during-pregnancy-and-the-postpartum-period No:804. Accessed July 25, 2023.
9. Bø K, Herbert RD. There is not yet strong evidence that exercise regimens other than pelvic floor muscle training can reduce stress urinary incontinence in women: a systematic review. *J Physiother*. 2013;59(3):159-168. doi:10.1016/S1836-9553(13)70180-2
10. Linda I, Lubis R, Siregar Y. The effectiveness of physical exercise, prenatal yoga and pregnancy gymnastics in Primigravida on childbirth duration. *Heal Notions*. 2017;1(2):113-117.
11. Kwon R, Kasper K, London S, Haas DM. A systematic review: the effects of yoga on pregnancy. *Eur J Obstet Gynecol Reprod Biol.* 2020;250:171-177. doi:10.1016/j.ejogrb.2020.03.044
12. Chen P-J, Yang L, Chou C-C, Li C-C, Chang Y-C, Liaw J-J. Effects of prenatal yoga on women's stress and immune function across pregnancy: a randomized controlled trial. *Complement Ther Med*. 2017;31:109-117. doi:10.1016/j.ctim.2017.03.003
13. Jahdi F, Sheikhan F, Haghani H, et al. Yoga during pregnancy: the effects on labor pain and delivery outcomes (A randomized controlled trial). *Complement Ther Clin Pract*. 2017;27:1-4. doi:10.1016/j.ctcp.2016.12.002
14. Ostrovsky DA. Yoga in the third trimester may reduce labor pain, duration of labor, and risk of cesarean section. *Explore (NY)*. 2018;14(2):163-164. doi:10.1016/j.explore.2017.12.003
15. Aktan B, Kayıkçıoğlu F, Akbayrak T. The comparison of the effects of clinical pilates exercises with and without childbirth training on pregnancy and birth results. *Int J Clin Pract*. 2021;75(10). doi:10.1111/ijcp.14516
16. Dastenaei BM, Aein F, Safdari F, Karimiankakolaki Z. Designing an intervention program over the effects of Pilates on pregnancy outcomes among pregnant women: a protocol study. *Int J Surg Protocols*. 2020;24:27-30. doi:10.1016/j.isjp.2020.10.004
17. Dias NT, Ferreira LR, Fernandes MG, Resende APM, Pereira-Baldon VS. A Pilates exercise program with pelvic floor muscle contraction: is it effective for pregnant women? A randomized controlled trial. *Neurourol Urodyn*. 2018;37(1):379-384. doi:10.1002/nau.23308
18. Isacowitz R. Pilates: Human Kinetics; 2022.
19. Santos-Rocha R, Branco M, Aguiar L, Vieira F, Veloso AP. Biomechanical adaptations of gait in pregnancy: implications for physical activity and exercise. In: exercise and sporting activity during pregnancy: evidence-based guidelines. 2019:95-134.
20. Coll CdVN, Domingues MR, Stein A, et al. Efficacy of regular exercise during pregnancy on the prevention of postpartum depression: the PAMELA randomized clinical trial. *JAMA Netw Open*. 2019;2(1). doi:10.1001/jamanetworkopen.2018.6861
21. Hyun A, Cho J. Effects of 12-week Pilates mat exercise on body composition, delivery confidence, and neck disability index in pregnant women. *Sports Sci*. 2019;36:43-55.
22. Sonmezer E, Özköslü MA, Yosmaoğlu HB. The effects of clinical Pilates exercises on functional disability, pain, quality of life and lumbopelvic stabilization in pregnant women with low back pain: a randomized controlled study. *J Back Musculoskelet Rehabil.* 2021;34(1):69-76. https://10.3233/BMR-191810
23. Mazzarino M, Kerr D, Morris ME. Pilates program design and health benefits for pregnant women: a practitioners' survey. *J Bodyw Mov Ther*. 2018;22(2):411-417. doi:10.1016/j.jbmt.2017.05.015
24. Sarpkaya Güder D, Yalvaç M, Vural G. The effect of pregnancy Pilates-assisted childbirth preparation training on childbirth fear and neonatal outcomes: a quasi-experimental/quantitative research. *Qual Quant.* 2018;52:2667-2679.doi:10.1007/s11135-018-0682-0
25. Kader M, Naim-Shuchana S. Physical activity and exercise during pregnancy. *Eur J Physiother*. 2014;16(1):2-9. doi:10.3109/21679169.2013.861509
26. de Souza Ferraz V, Peixoto C, Resstel APF, de Paula YTC, de Souza Pegorare ABG. Effect of the Pilates method on pain and quality of life in pregnancy: a systematic review and meta-analysis. *J Bodyw Mov Ther*. 2023;35:220-227.doi:10.1016/j.jbmt.2023.04.076
27. Mazzarino M, Morris ME, Kerr D. Pilates for low risk pregnant women: study protocol for a randomized controlled trial. *J Bodyw Mov Ther.* 2021;25:240-247.doi:10.1016/j.jbmt.2020.12.015
28. Rodríguez-Díaz L, Ruiz-Frutos C, Vázquez-Lara JM, Ramírez-Rodrigo J, Villaverde-Gutiérrez C, Torres-Luque G. Effectiveness of a physical activity programme based on the Pilates method in pregnancy and labour. *Enfermería Clínica (English Edition)*. 2017;27(5):271-277.doi:10.1016/j.enfcle.2017.05.007
29. Feria-Ramírez C, Gonzalez-Sanz JD, Molina-Luque R, Molina-Recio G. The effects of the Pilates method on pelvic floor injuries during pregnancy and childbirth: a quasi-experimental study. *Int J Environ Res Public Health*. 2021;18(13):6995. doi:10.3390/ijerph18136995
30. Ghandali NY, Iravani M, Habibi A, Cheraghian B. The effectiveness of a Pilates exercise program during pregnancy on childbirth outcomes: a randomized controlled clinical trial. *BMC Pregnancy Childbirth*. 2021;21(1):1-11.
31. Kirici P, Nacar MC, Karaçor T, et al. Pilates workouts can improve the labor and newborn outcomes: a case control study. *J Surg Med*. 2021;5(6):642-647. doi:10.28982/josam.951898
32. Zaman AY. Obstetric, maternal, and neonatal outcomes after Pilates exercise during pregnancy: a systematic review and meta-analysis. *Medicine*. 2023;102(21): e33688-e. doi:10.1097/MD.0000000000033688
33. Brosnan P, Nauphal M, Tompson MC. Acceptability and feasibility of the online delivery of hatha yoga: a systematic review of the literature. *Complement Ther Med*. 2021;60:102742. doi:10.1016/j.ctim.2021.102742
34. Corrigan L, Moran P, McGrath N, Eustace-Cook J, Daly D. The characteristics and effectiveness of pregnancy yoga interventions: a systematic review and meta-analysis. *BMC Pregnancy Childbirth*. 2022;22(1):1-21.
35. Mooventhan A. A comprehensive review on scientific evidence-based effects (including adverse effects) of yoga for normal and high-risk pregnancy-related health problems. J Bodyw Mov Ther. 2019;23(4):721-727.doi:10.1016/j.jbmt.2019.03.005
36. Campbell V, Nolan M. 'It definitely made a difference': a grounded theory study of yoga for pregnancy and women's self-efficacy for labour. *Midwifery*. 2019; 68: 74-83. doi:10.1016/j.midw.2018.10.005

37. Chuntharapat S, Petpichetchian W, Hatthakit U. Yoga during pregnancy: effects on maternal comfort, labor pain, and birth outcomes. *Complement Ther Clin Pract*. 2008;14(2):105-115. doi:10.1016/j.ctcp.2007.12.007

38. Bolanthakodi C, Raghunandan C, Saili A, Mondal S, Saxena P. Prenatal yoga: effects on alleviation of labor pain and birth outcomes. *J Altern Complement Med*. 2018;24(12):1181-1188.. doi:10.1089/acm.2018.0079

39. Pais M, Pai MV, Kamath A, Bhat R, Bhat P, Joisa GH. A randomized controlled trial on the efficacy of integrated yoga on pregnancy outcome. *Holist Nurs Pract*. 2021;35(5):273-280. doi:10.1097/HNP.0000000000000472

40. Rong L, Wang R, Ouyang Y-Q, Redding SR. Efficacy of yoga on physiological and psychological discomforts and delivery outcomes in Chinese primiparas. *Complement Ther Clin Pract*. 2021;44:101434. doi:10.1016/j.ctcp.2021.101434

41. Yekefallah L, Namdar P, Dehghankar L, Golestaneh F, Taheri S, Mohammadkhaniha F. The effect of yoga on the delivery and neonatal outcomes in nulliparous pregnant women in Iran: a clinical trial study. *BMC Pregnancy Childbirth*. 2021;21(1):351.doi:10.1186/s12884-021-03794-6

42. Rong L, Dai LJ, Ouyang YQ. The effectiveness of prenatal yoga on delivery outcomes: a meta-analysis. *Complement Ther Clin Pract*. 2020;39:101157 doi:10.1016/j.ctcp.2020.101157

43. Riawati MS, Budihastuti UR, Prasetya H. The effect of prenatal yoga on birth labor duration and pain: a meta-analysis. *J Matern Child Health*. 2021; 6(3):327-337. doi:10.26911/thejmch.- 2021.06.03.07

44. Zhang L, Wang S. The efficacy of prenatal yoga on labor pain: a systematic review and meta-analysis. *Altern Ther Health Med*. 2023;29(5):121-125.

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